

# FAN8200/FAN8200D

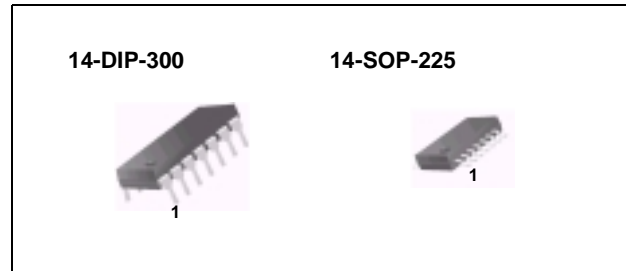
## Low Voltage/Low Saturation Stepping Motor Driver

### Features

- 3.3V and 5V MPU interface
- Dual H-bridge drivers for bipolar stepping motor drives
- Built-in vertical-PNP power transistors
- Wide supply voltage range( $V_{CC} = 2.5V \sim 7.0V$ )
- Low saturation voltage (0.4V@ 0.4A)
- Built-in chip enable function for each bridge
- Built-in shoot-through current protection
- Built-in thermal shutdown(TSD) function

### Description

The FAN8200/FAN8200D is a monolithic integrated circuit designed for two-phase stepping motor drive systems. It has dual H-bridge drivers with vertical-PNP power transistors. Each of the bridges has an independent enable pin, therefore it can be used for other applications as well as stepping motor drive systems.



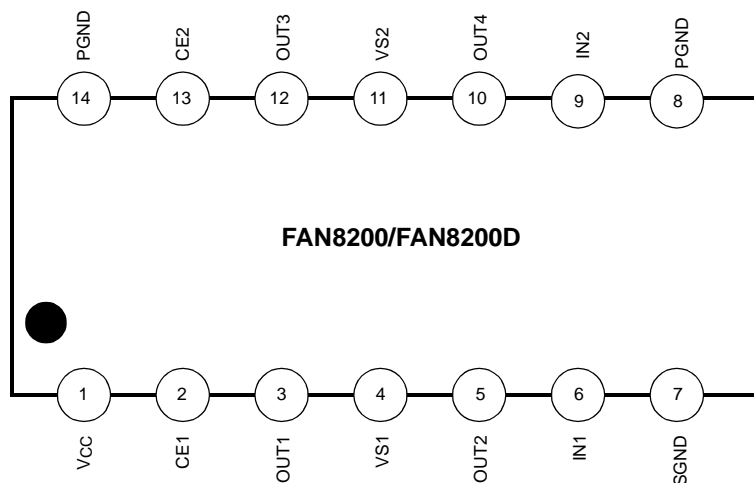
### Typical Application

- General low voltage stepping motor driver
- Floppy disk driver
- Camera stepping motor driver
- PC camera or security equipment motion controller
- Two channel dc motor driver for a digital still camera(DSC)
- MPU interfaced general power driver(buffer)

### Ordering Information

Device	Package	Operating Temp.
FAN8200	14-DIP-300	-20 ~ +75°C
FAN8200D	14-SOP-225	-20 ~ +75°C
FAN8200DTF	14-SOP-225	-20 ~ +75°C

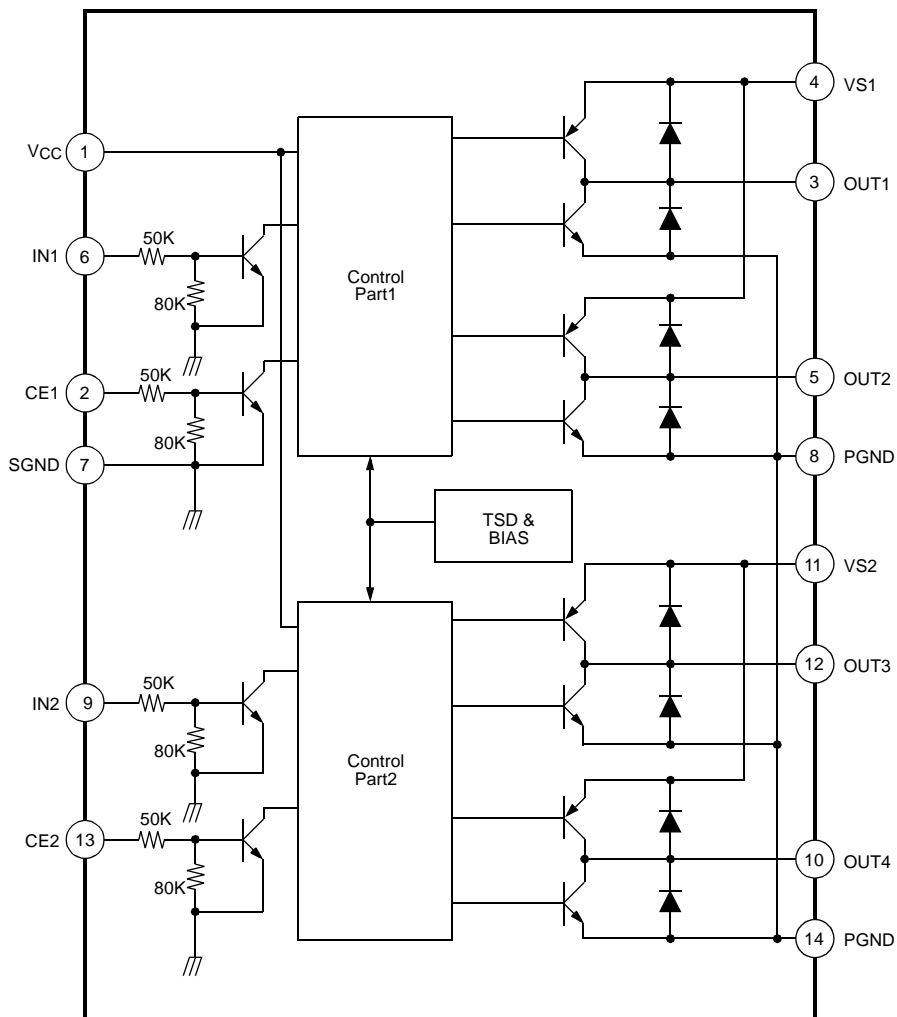
## Pin Assignments



## Pin Definitions

Pin Number	Pin Name	I/O	Pin Function Description
1	VCC	-	Logic part supply voltage
2	CE1	I	Chip enable 1
3	OUT1	O	Output 1
4	VS1	-	Power supply 1
5	OUT2	O	Output 2
6	IN1	I	Input 1
7	SGND	-	Signal ground
8	PGND	-	Power ground
9	IN2	I	Input 2
10	OUT4	O	Output 4
11	VS2	-	Power supply 2
12	OUT3	O	Output 3
13	CE2	I	Chip enable 2
14	PGND	-	Power ground

# Internal Block Diagram



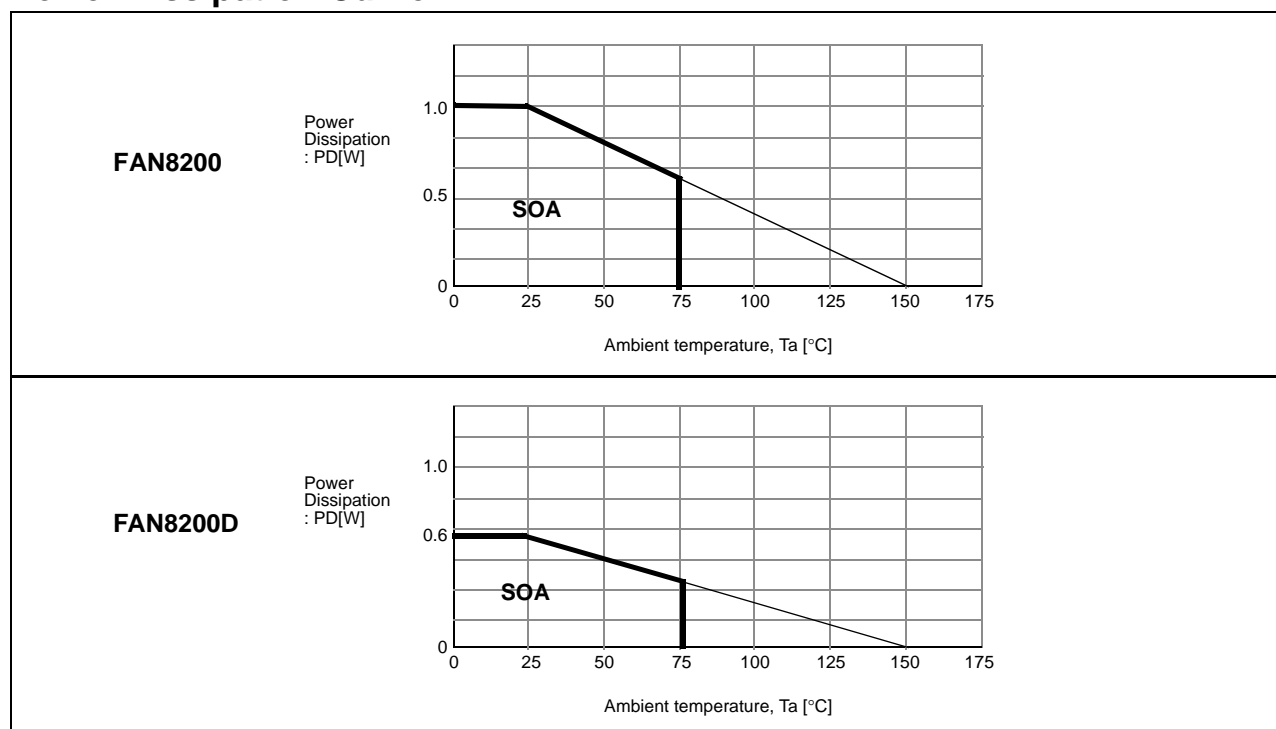
## Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Value	Unit
Supply voltage	V <sub>CC</sub> (MAX)	9.0	V
Power supply voltage	V <sub>S</sub> (MAX)	9.0	V
Output voltage	V <sub>OUT</sub> (MAX)	V <sub>S</sub> + V <sub>CF</sub>	V
Input voltage	V <sub>IN</sub> (MAX)	7.0	V
Peak output current per channel	I <sub>O</sub> (PEAK)	1	A
Continuous output current per channel	I <sub>O</sub>	0.65 (FAN8200) 0.4 (FAN8200D)	A
Power dissipation	P <sub>D</sub> <sup>note</sup>	1.0 (FAN8200) 0.6 (FAN8200D)	W
Junction temperature	T <sub>J</sub>	150	°C
Storage temperature	T <sub>STG</sub>	-40 ~ 125	°C
Operating temperature	T <sub>A</sub>	-20 ~ 75	°C

### Notes:

- When mounted on 76.2mm × 114mm × 1.57mm PCB (glass epoxy material).
- Power dissipation reduces 8.0mW/°C (FAN8200) and 4.8mW/°C(FAN8200D) for using above Ta=25°C.
- Do not exceed P<sub>D</sub> and SOA(Safe Operating Area).

## Power Dissipation Curve



## Recommended Operating Conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max	Unit
Logic circuit supply voltage	V <sub>CC</sub>	2.5	-	7.0	V
Power supply voltage	V <sub>S</sub>	2.5	-	7.0	V

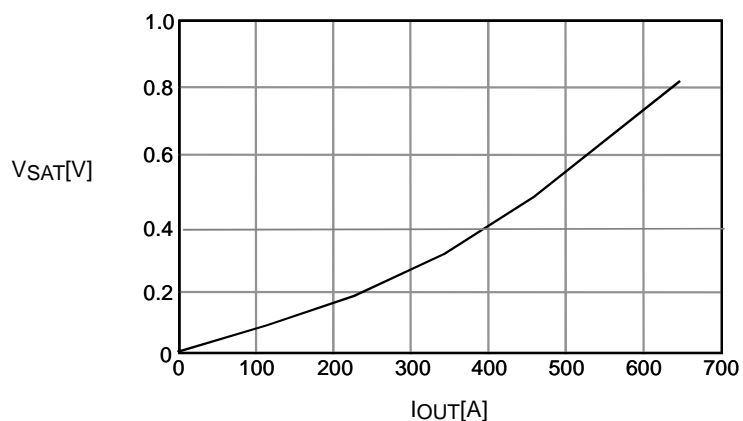
## Electrical Characteristics

( $T_a=25^{\circ}\text{C}$ ,  $V_{CC}=5\text{V}$ ,  $V_{S1}=3\text{V}$ ,  $V_{S2}=3\text{V}$ , unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply current 1	$I_{CC1}$	$CE1, 2=0\text{V}$	-	0.1	10	$\mu\text{A}$
Supply current 2	$I_{CC2}$	$CE1=3\text{V}$ , $CE2=0\text{V}$ or $CE1=0\text{V}$ , $CE2=3\text{V}$	-	12	18	$\text{mA}$
Saturation voltage 1 (Upper + Lower Total)	$V_{SAT1}$	$CE1=3\text{V}$ , $IN1=3\text{V}$ or $0\text{V}$ , $I_{OUT}=0.2\text{A}$	-	0.2	0.3	$\text{V}$
Saturation voltage 2 (Upper + Lower Total)	$V_{SAT2}$	$CE1=3\text{V}$ , $IN1=3\text{V}$ or $0\text{V}$ , $I_{OUT}=0.4\text{A}$	-	0.4	0.6	$\text{V}$
Input high level voltage	$V_{INH}$	-	1.8	-	$V_{CC}$	$\text{V}$
Input low level voltage	$V_{INL}$	-	-0.3	-	0.7	$\text{V}$
Input current	$I_{IN}$	$IN=3\text{V}$ , Each pin	-	100	200	$\mu\text{A}$
Chip enable current	$I_{CE}$	$CE=3\text{V}$ , Each pin	-	100	200	$\mu\text{A}$
Clamp diode leakage current	$I_{LEAK}$	$V_{CC}=7\text{V}$ , $V_S=7\text{V}$	-	-	30	$\mu\text{A}$
Clamp diode voltage	$V_{CF}$	$I_{OUT}=0.4\text{A}$	-	-	1.7	$\text{V}$

## Typical Performance Characteristics

### $V_{SAT}$ vs. $I_{OUT}$ Characteristics Graph

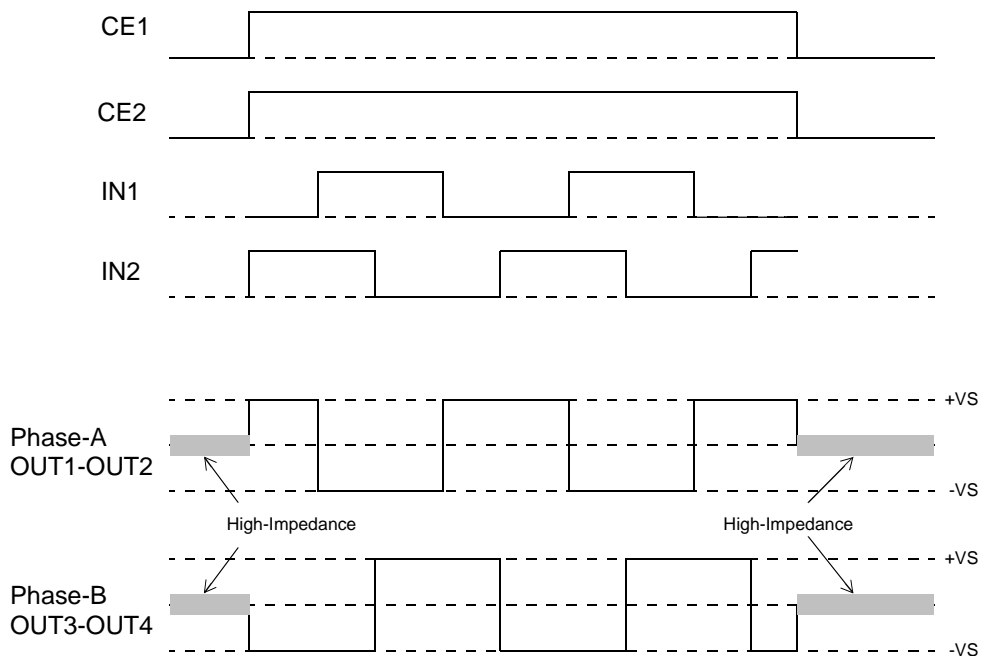


## Function Descriptions

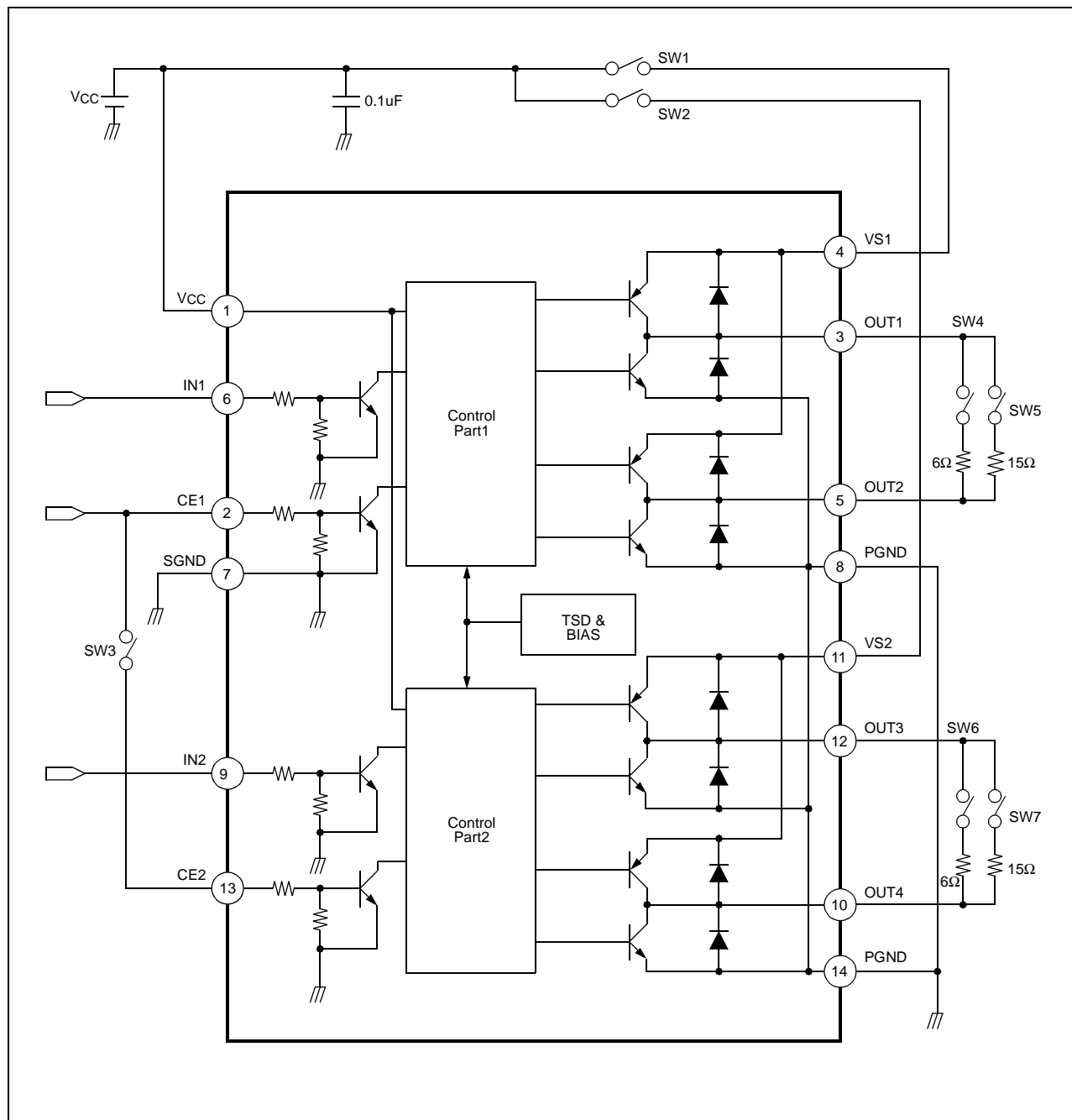
CE1	IN1	OUT1	OUT2
Low	X	Z	Z
High	Low	High	Low
High	High	Low	High

CE2	IN2	OUT3	OUT4
Low	X	Z	Z
High	Low	High	Low
High	High	Low	High

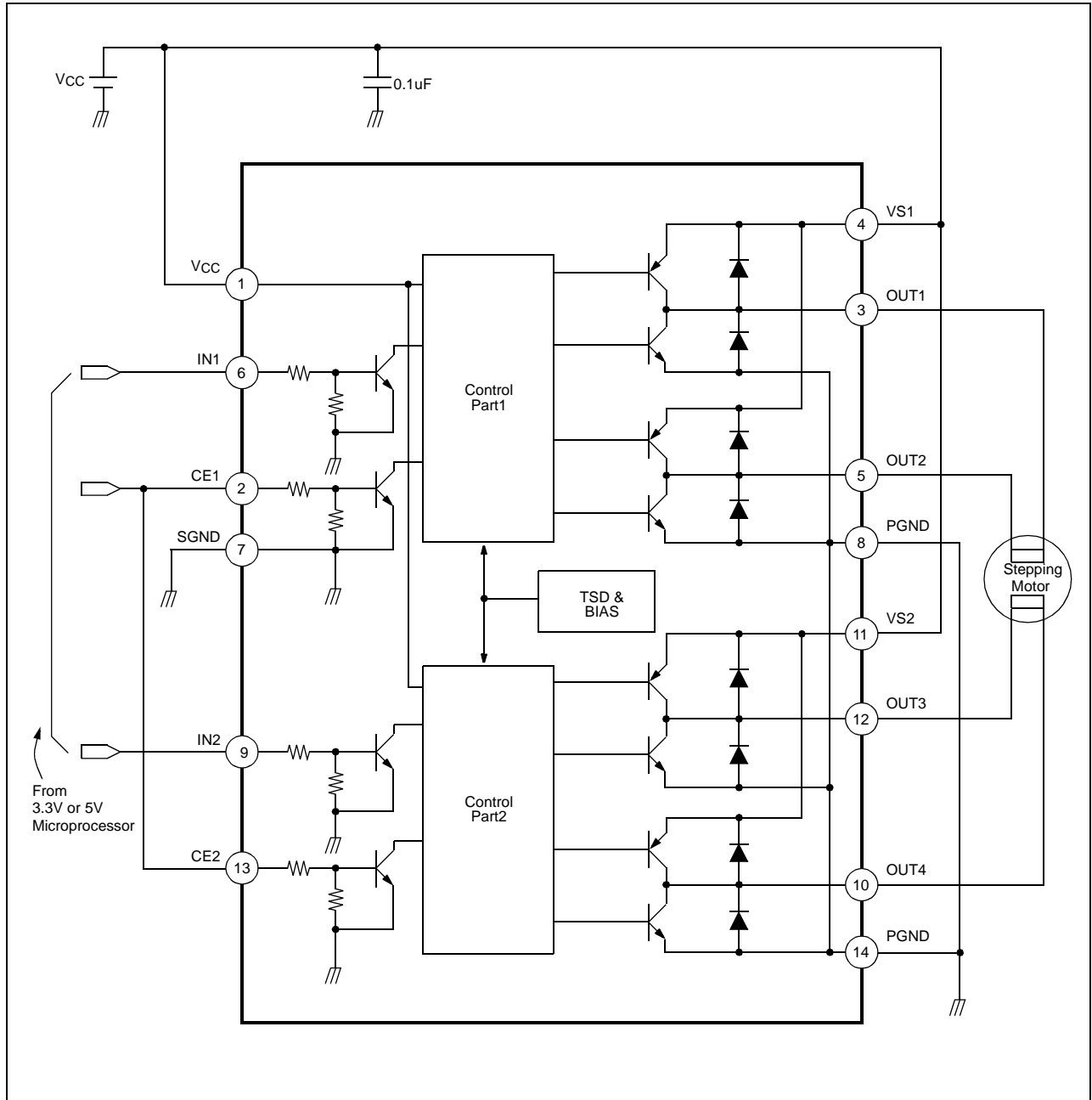
X: don't care  
Z: high-impedance



# Test Circuits



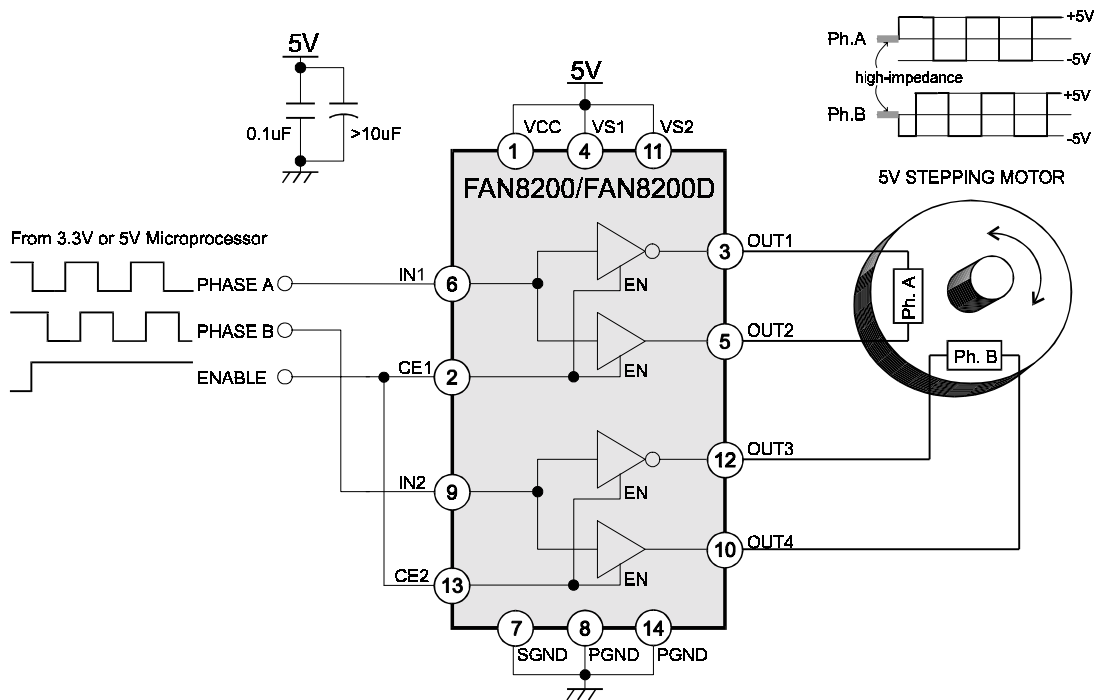
# Typical Application Circuit





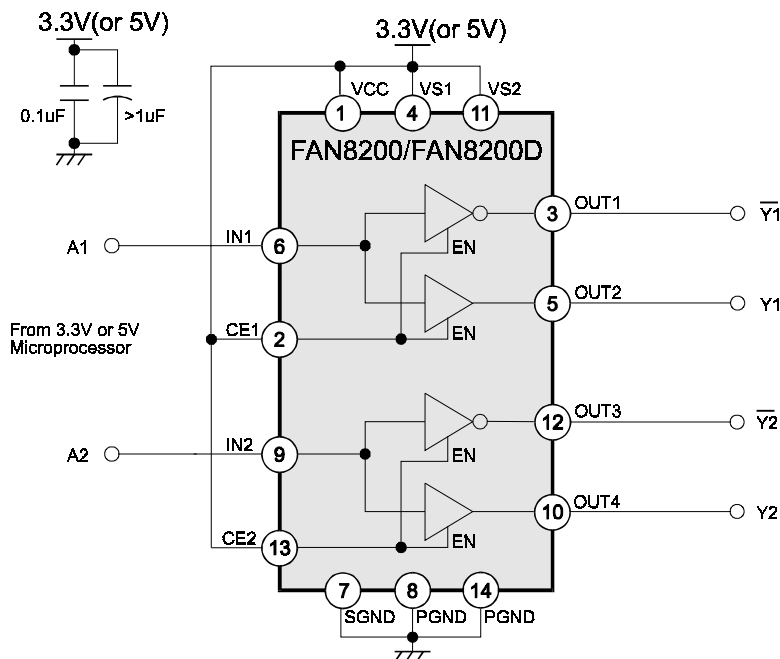
## Application Example - Full Step Bipolar Drive

### Circuit Schematics



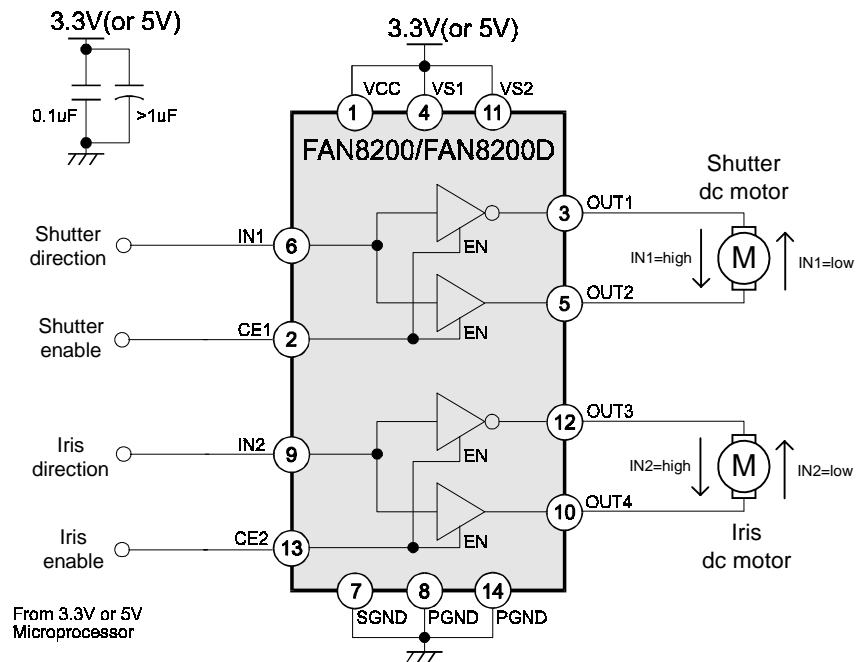
## Application Example - Large Current Buffer

### Circuit Schematics



## Application Example - 2-Ch. dc Motor Driver for a Digital Still Camera(DSC)

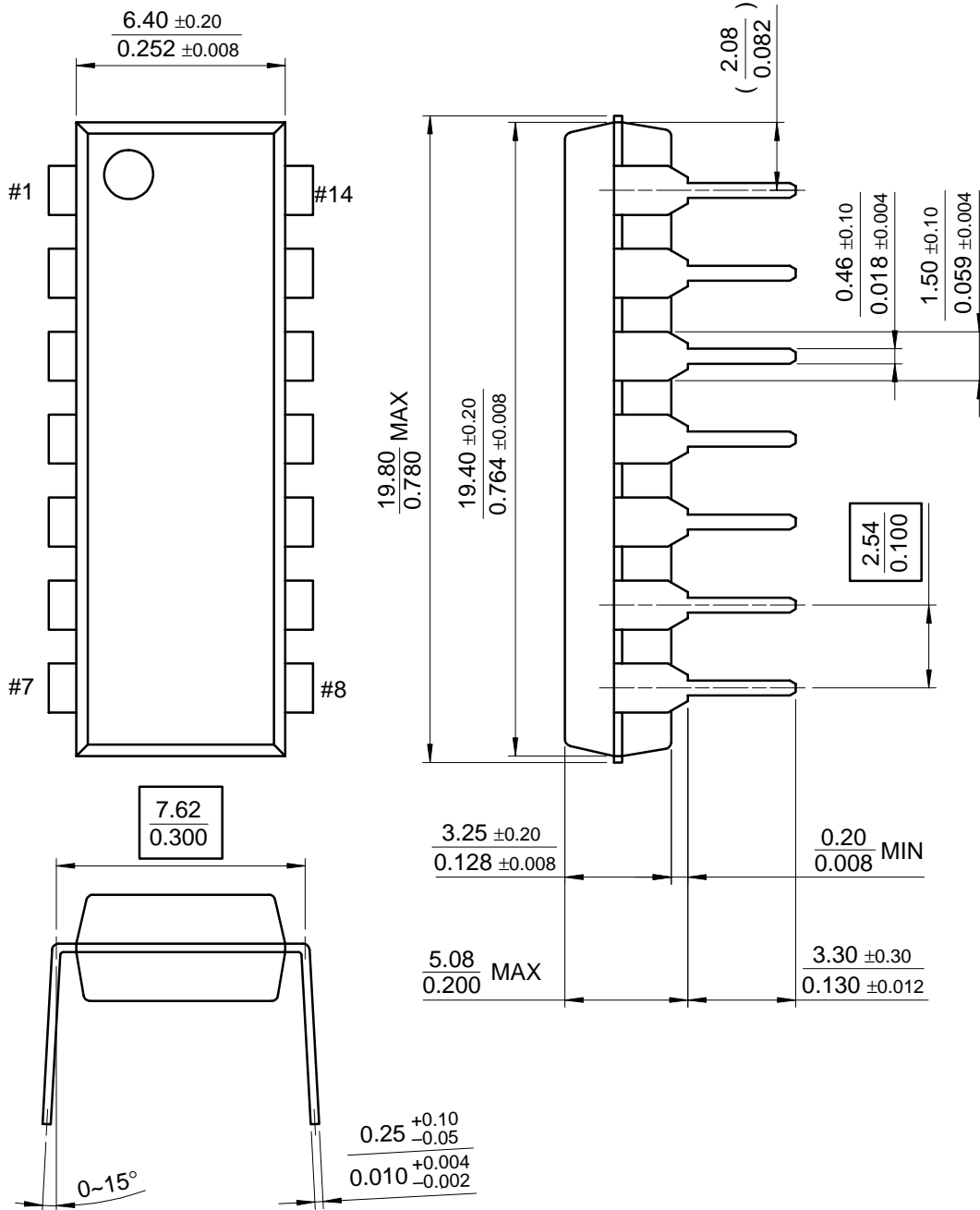
### Circuit Schematics



# Mechanical Dimensions (Unit: mm)

## Package Dimensions

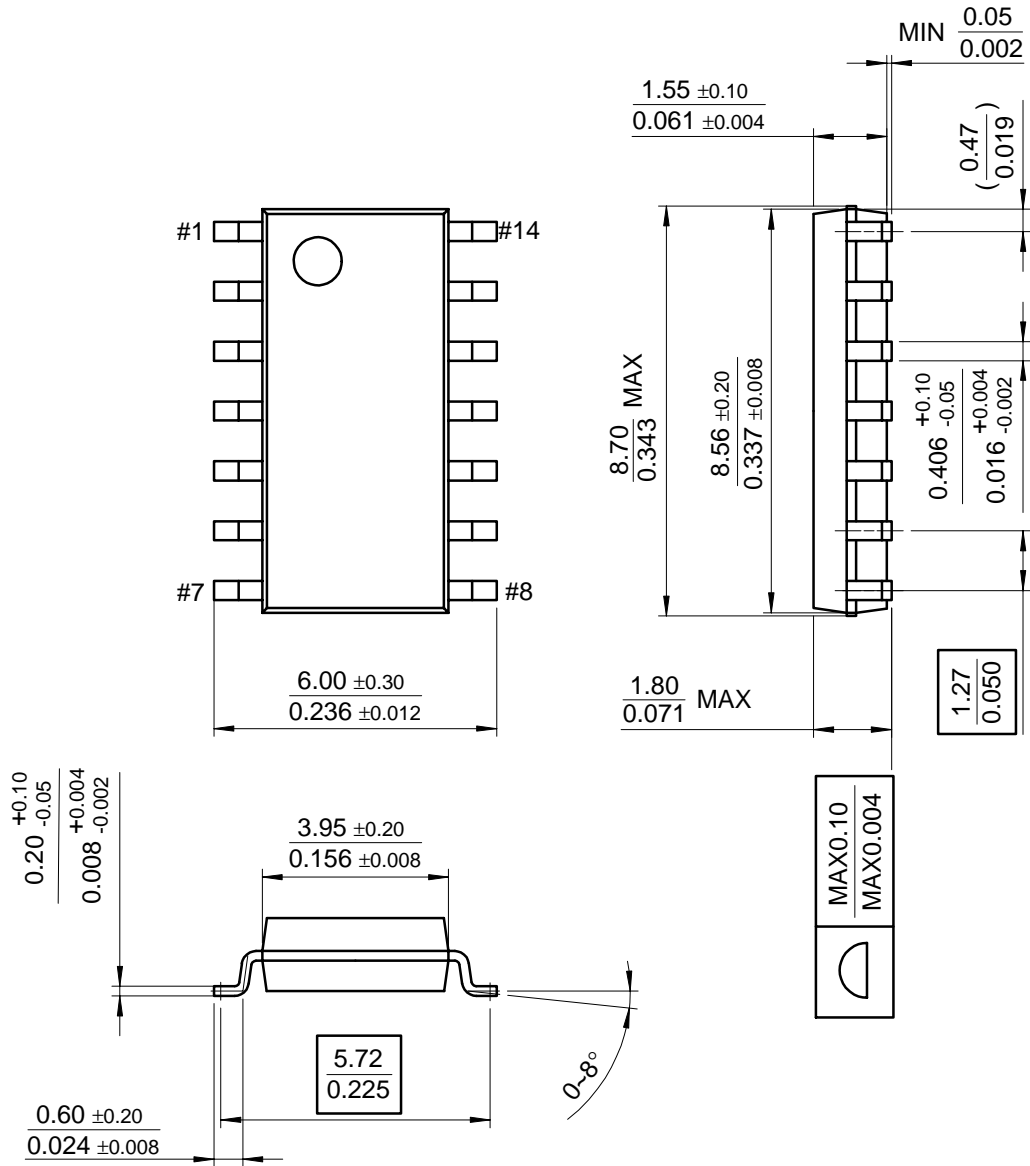
### 14-DIP-300



Mechanical Dimensions (Unit: mm) (Continued)

Package Dimensions

14-SOP-225





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